Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of amplifying a template DNA molecule comprising:

incubating said template DNA molecule with a reaction mixture comprising a DNA polymerase and at least **[[one]]** **two** accessory ~~**protein**~~ **proteins** at a constant temperature to produce amplified product, wherein production of amplified product does not require exogenously-added oligonucleotide primers and said template DNA molecule does not have a terminal protein covalently bound to either 5' end, and wherein said method is performed under conditions such that the amount of amplified product is at least ~~**10-fold**~~ **100-fold** greater than the amount of template DNA put into the mixture.

2 – 10. (Canceled)

11. (Currently amended) A method of amplifying a template DNA molecule comprising:

incubating said template DNA molecule with an *in vitro* reaction mixture comprising a DNA polymerase **with a normal level of exonuclease activity, a DNA polymerase modified to have reduced 3' to 5' exonuclease activity**, a helicase, **[[and]]** a primase**, and a single stranded DNA binding protein** at a constant temperature to produce amplified product, wherein said method is performed under conditions such that the amount of amplified product is at least 10-fold greater than the amount of template DNA put into the mixture**, and wherein said method is performed under conditions such that production of amplified product does not require exogenously-added oligonucleotide primers**.

12 – 23. (Canceled)

24. (Currently amended) A method of amplifying a template DNA molecule comprising:

incubating said template DNA molecule in an *in vitro* reaction mixture comprising a wild-type T7 DNA polymerase and a T7 DNA polymerase modified to have reduced 3' to 5' exonuclease activity, a 63-kDa form of a gene 4 protein from bacteriophage T7 and a single-stranded **DNA** binding protein from *Escherichia coli* at a constant temperature to produce

amplified product, wherein production of amplified product does not require exogenously-added oligonucleotide primers and the amount of amplified product is at least 10-fold greater than the amount of template DNA put into the mixture.

25 – 123. (Canceled)

124. (Previously presented) The method of claim 1, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

125. (Previously presented) The method of claim 1, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000-fold greater than the amount of template DNA put into the mixture.

126. (Previously presented) The method of claim 1, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000,000-fold greater than the amount of template DNA put into the mixture.

127. (Previously presented) The method of claim 1, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000,000-fold greater than the amount of template DNA put into the mixture.

128. (Previously presented) The method of claim 1, wherein said method is performed under conditions such that amplification of template DNA is exponential.

129. (Cancelled).

130. (Previously presented) The method of claim 1, wherein said DNA polymerase is a bacteriophage DNA polymerase.

131. (Previously presented) The method of claim 1, wherein said DNA polymerase is a bacteriophage T7 DNA polymerase.

132. (Currently amended) The method of claim 1, wherein said **reaction mixture** ~~**DNA polymerase**~~ comprises a ~~**mixture of a T7**~~ DNA polymerase with a normal level of exonuclease activity and a **[[T7]]** DNA polymerase modified to have reduced 3' to 5' exonuclease activity.

133. (Currently amended) The method of claim 132, wherein said **[[T7]]** DNA polymerase with a normal level of exonuclease activity has about 5,000 units of exonuclease activity per mg protein.

134. (Currently amended) The method of claim 132, wherein said **[[T7]]** DNA polymerase modified to have reduced 3' to 5' exonuclease activity has less than 50% of the 3' to 5' exonuclease activity of said **[[T7]]** DNA polymerase with a normal level of exonuclease activity.

135. (Currently amended) The method of claim 132, wherein the molar ratio of said **[[T7]]** DNA polymerase modified to have reduced 3' to 5' exonuclease activity to said **[[T7]]** DNA polymerase with a normal level of exonuclease activity is greater than 1.

136. (Currently amended) The method of claim 132, wherein the molar ratio of said **[[T7]]** DNA polymerase modified to have reduced 3' to 5' exonuclease activity to said **[[T7]]** DNA polymerase with a normal level of exonuclease activity is approximately 20:1.

137. (Previously presented) The method of claim 1, wherein said accessory protein is a helicase.

138. (Previously presented) The method of claim 1, wherein said accessory protein is a primase.

139. (Currently amended) The method of claim 1, wherein said accessory protein is the **63-kDa** helicase/primase from bacteriophage T7.

140. (Cancelled).

141. (Previously presented) The method of claim 1, wherein said reaction mixture further comprises a single-stranded DNA binding protein.

142. (Previously presented) The method of claim 141, wherein said single-stranded DNA binding protein is from *Escherichia coli*.

143. (Previously presented) The method of claim 1, wherein said constant temperature is less than 60° C.

144. (Previously presented) The method of claim 1, wherein said constant temperature is less than 50° C.

145. (Previously presented) The method of claim 1, wherein said constant temperature is less than 45° C.

146. (Previously presented) The method of claim 1, wherein said constant temperature is less than 40° C.

147. (Previously presented) The method of claim 1, wherein said constant temperature is about 37° C.

148. (Currently amended) The method of claim 1, wherein the reaction mixture further comprises one or more reagents selected from the group consisting of a nucleoside diphosphokinase, an inorganic pyrophosphatase, an ATP regeneration system, **double stranded exonuclease, single stranded DNA binding protein,** and a ligase.

149. (Previously presented) The method of claim 1, wherein the reaction mixture further comprises a nucleoside diphosphokinase.

150. (Previously presented) The method of claim 1, wherein the reaction mixture further comprises an inorganic pyrophosphatase.

151. (Previously presented) The method of claim 1, wherein the reaction mixture further comprises an ATP regeneration system.

152. (Previously presented) The method of claim 151, wherein said ATP regeneration system comprises a combination of creatine kinase and phosphocreatine.

153. (Previously presented) The method of claim 1, wherein the reaction mixture further comprises a ligase.

154. (Previously presented) The method of claim 153, wherein said ligase is bacteriophage T7 DNA ligase.

155. (Previously presented) The method of claim 1, wherein the reaction mixture further comprises one or more additives selected from the group consisting of potassium glutamate, DMSO and dextran polymer.

156. (Cancelled)

157. (Previously presented) The method of claim 11, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

158. (Previously presented) The method of claim 11, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000,000-fold greater than the amount of template DNA put into the mixture.

159. (Previously presented) The method of claim 11, wherein said method is performed under conditions such that amplification of template DNA is exponential.

160. (Cancelled).

161. (Previously presented) The method of claim 24, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

162. (Previously presented) The method of claim 24, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000-fold greater than the amount of template DNA put into the mixture.

163. (Previously presented) The method of claim 24, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000,000-fold greater than the amount of template DNA put into the mixture.

164. (Previously presented) The method of claim 24, wherein said method is performed under conditions such that amplification of template DNA is exponential.

165-169. (Cancelled).

170. (New) The method of claim 1, wherein the reaction mixture further comprises a double stranded exonuclease.

171. (New) The method of claim 1, wherein the reaction mixture further comprises a single stand DNA binding protein from *Escherichia coli.*

172. (New) The method of claim 1, wherein the reaction mixture further comprises a single stand DNA binding protein from an organism other than *Escherichia coli.*

173. (New) The method of claim 172, wherein said single stand DNA binding protein is T7 single stranded DNA binding protein.

174. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

175. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is at least 1000-fold greater than the amount of template DNA put into the mixture.

176. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000-fold greater than the amount of template DNA put into the mixture.

177. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is at least 1000,000-fold greater than the amount of template DNA put into the mixture.

178. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000,000-fold greater than the amount of template DNA put into the mixture.

179. (New) The method of claim 148, wherein said method is performed under conditions such that the amount of amplified product is exponential.

180. (New) The method of claim 24, wherein the reaction mixture further comprises one or more reagents selected from the group consisting of a nucleoside diphosphokinase, an inorganic pyrophosphatase, an ATP regeneration system, double stranded exonuclease, T7 single stranded DNA binding protein and a ligase.

181. (New) The method of claim 24, wherein the reaction mixture further comprises a nucleoside diphosphokinase.

182. (New) The method of claim 24, wherein the reaction mixture further comprises an inorganic pyrophosphatase.

183. (New) The method of claim 24, wherein the reaction mixture further comprises an ATP regeneration system.

184. (New) The method of claim 173, wherein said ATP regeneration system comprises a combination of creatine kinase and phosphocreatine.

185. (New) The method of claim 24, wherein the reaction mixture further comprises a ligase.

186. (New) The method of claim 185, wherein said ligase is bacteriophage T7 DNA ligase.

182. (New) The method of claim 24, wherein the reaction mixture further comprises a double stranded exonuclease.

183. (New) The method of claim 24, wherein the reaction mixture further comprises one or more additives selected from the group consisting of potassium glutamate, DMSO and dextran polymer.

184. (New) The method of claim 24, wherein the reaction mixture further comprises a double stranded exonuclease.

185. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

186. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is at least 1000-fold greater than the amount of template DNA put into the mixture.

187. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is at least 100,000-fold greater than the amount of template DNA put into the mixture.

188. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is at least 1,000,000-fold greater than the amount of template DNA put into the mixture.

189. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000,000-fold greater than the amount of template DNA put into the mixture.

190. (New) The method of claim 180, wherein said method is performed under conditions such that the amount of amplified product is exponential.

191. (New) The method of claim 132, wherein the reaction mixture further comprises one or more reagents selected from the group consisting of a nucleoside diphosphokinase, an inorganic pyrophosphatase, an ATP regeneration system, double stranded exonuclease, single stranded DNA binding protein, and a ligase.

192. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is at least 100-fold greater than the amount of template DNA put into the mixture.

193. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is at least 1000-fold greater than the amount of template DNA put into the mixture.

194. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000-fold greater than the amount of template DNA put into the mixture.

195. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is at least 1000,000-fold greater than the amount of template DNA put into the mixture.

196. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is at least 10,000,000-fold greater than the amount of template DNA put into the mixture.

197. (New) The method of claim 191, wherein said method is performed under conditions such that the amount of amplified product is exponential.